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BIOS

Alberta Society of Professional Biologists • April 2003 Volume 18 • Number 1

CE EFFECTS ON ALASKA'S NORTH SLOPE

Since the 1968 discovery of huge oil reserves in Prudhoe Bay, Alaska's North Slope has been a site of oil exploration and production that, by the end of 2002, had produced about 14 billion barrels of crude oil. Active exploration on the arctic coastal plain is now expanding incrementally into the National Petroleum Reserve-Alaska, the Arctic National Wildlife Refuge, and the foothills of the Brooks Range.

Northern Alaska's environment and culture have already been significantly affected by oil infrastructure and activities. There have been many benefits to North Slope residents including more jobs and improved hospitals and schools. These economic benefits have been accompanied by environmental and social consequences, including effects of the roads, infrastructure and activities of oil exploration and production on the terrain, plants, animals and peoples of the North Slope and the adjacent marine environment.

"Northern Alaska's environment and culture have already been significantly affected"

The National Academies convened a committee to assess cumulative effects of oil and gas activities - both present and likely future - on the North Slope and adjacent marine waters for the time period of 1965 to 2025 or 2050.

Accumulated Effects To Date

Unlike other U.S. oil fields, those on the North Slope are underlain by permafrost. If permafrost thaws, the ground surface and the structures it supports will settle. To minimize disruption to the ground surface, the North Slope industrial infrastructure is specially built: pipelines are generally elevated rather than buried, and roads and industrial facilities are raised on thick gravel berms.

Nearly all of the roads, pads, pipelines and other infrastructure ever built are still in place. The petroleum industry continues to introduce technological innovations to reduce its footprint (e.g. directional drilling and the use of ice roads and pads, drilling platforms, and new kinds of vehicles).

The committee identified the following areas in which there was evidence of effects that have accumulated.

Roads - The effects are as far-reaching and complex as any physical component of the North Slope oil fields. In addition to their direct effects on the tundra, indirect effects are caused by dust, roadside flooding, thawing of permafrost, and roadside snow accumulation. Roads and activities on them also alter animal habitat and behavior and wildland values and can increase access of hunters, tourists, and others to previously inaccessible parts of the region; enhance communication among

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Alberta Society of Professional Biologists
P.O. Box 21104
Edmonton, Alberta
T5R 2V4
Tel: (780) 434-5765
or 1-800-711-5765
Fax: (780) 413-0076
E-mail: pbiol@aspb.ab.ca
http://www.aspb.ab.ca

President
Teresa de Grosbois (403) 299-2778
President Elect
Robert Dallas (403) 735-2245
Past President
Judy Bennett (403) 221-3003
Secretary
Maire Luoma (403) 716-8135
Treasurer
Gary Ash (780) 483-3499
Director (Registration Chair)
Doug Collister (403) 246-2697
Director
Bob Shelast (403) 716-8134
Director
Henry Epp (403) 201-2583
Director
Christine Brown (403) 297-8840
Director
Carol Engstrom (403) 298-6175
Public Member
Stuart Ross (403) 777-0111
Registrar
Carl Warner (403) 569-6591
Discipline Committee
Brian Bietz (403) 297-4303
Practice Review Committee
Don McCabe (403) 297-5671
Professional Liaison
Rob Powell (780) 422-1977
Executive Director
Robin Leech (780) 452-1311
Professional Development (Calgary)
Carol Engstrom (403) 298-6175
Professional Development (Edmonton)
Lynn Maslen (780) 452-1311
Communications
Maire Luoma (403) 266-6363
Webmaster
Jim Case (403) 714-9150
Office Administrator
Jill Lane (780) 434-5765

BIOS is written for the enjoyment of the members of the Alberta Society of Professional Biologists and those interested in the field of professional biology. Articles or comments are welcomed and should be communicated to the ASPB Office. Editing and layout by Gavin More, 49 NORTH Creative Learning and Training.

WELCOME NEW MEMBERS

Regular: David Andison, John Boorman, Sarah Boyle, Ian Campbell, George Duffy, Derek Ebner, Elan Gluckie, Bart Koppe, Kristin Kumpula, Darren Lapp, Albert Lees, Shawn Martin, Laurie McEachern, Brett McLeod, Beth Michener, Colleen Rosenegger, Troy Sorensen, John Stadt, Chris Stroich, Angela Varley, Scott Wagner, Dan Watson, Troy Whidden

Biologist In Training: Adriano Andreachhi, Ken Armstrong, Dwayne Fournel, Kimberley Greateux, Wayner Jackson, Aaron Trites, David Turner

Student: Kelli Kirkham

Membership Update

ASPB membership as of April 30, 2003: **Total 534**

Regular	433	Biologist in Training	49
Honorary	6	Temporary Withdrawn	27
Student	11	Public Member	1
Associated	4		

2001 ASPB Conference Proceedings

The Cumulative Environmental Effects Management Proceedings are now available through the Alberta Society of Professional Biologists office. The cost of the 487 page soft cover book is $40.00 plus GST (includes postage and handling within Canada). If you would like a copy of the book please contact the office at 780-434-5765 or by email at pbiol@aspb.ab.ca with your address and form of payment. Payment must be received prior to shipping.

Professional Liaison Committee concluded

We have been advised that POARA may be dissolved in about three years. Between now and then, the ASPB and Alberta Human Resources will be working closely together during this review.

As Executive Director, I attended a meeting with Stuart Ross, our Public Member, regarding the establishment of the new Provincial Privacy Legislation and Self-Governing Professional Organizations. A plan has been developed to ensure that ASPB actions will conform to privacy requirements that the Alberta Government hopes to implement this year.

Robin Leech, P.Biol.
Executive Director
releech@telusplanet.net

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President's Message

To prepare for this year's annual report I did two things: reviewed past Board meeting minutes, and wished that I had actually written BIOS articles on a regular basis to inform members of "Board Happenings" over the past year.

While I will focus on the Board of Directors activities, the Society would not be alive and growing as well as it is without the support of the many volunteers that make up our committees.

In working with each of them over the past year, and during my time on committees and the Board, I have been overwhelmed by their dedication and commitment to the society and its members. Thank you all for the time and effort you have each put into making our Society such a success this year.

The following list summarizes the challenges that we faced:

Goverance

- Order in Council passage of the new Professional Biologists Regulation in 2002
- Drafting of new ASPB By-laws for voting by membership at the 2003 AGM
- Professional liaison discussions with Alberta Society of Engineering Technologists (see article below)
- Review of legislation for other professional associations

Membership Services

- Executive Director presentations to universities
- Five Year Partnership with Calgary Zoo to establish a Conservation Research Scholarship
- Change in University Scholarships to plaques recognizing achievement
- Development of a new website
- Email "Bulletin" of current happenings
- Regular BIOS editions
- Proposed Mentorship program
- Sale of ASPB vests at Access Management Conference

Professional Development

- Calgary and Edmonton Professional Development presentations
- Proposed Professional Development system
- Review of academic and work experience qualifications criteria of applicants

Judy Bennett P. Biol.
President 2002/03

Professional Liaison Committee

Meetings between five registered societies, initiated by Tim Schultz, Executive Director of ASET (Alberta Society of Engineering Technologists), started on 4 July 2002. The other four societies involved were the chemists, biologists, landscape architects, and interior designers. The intent was/is to bring all these societies under an umbrella in the same format as at present exists with the Health Professions Act. Under a format like that of the Health Professions Act (covering about 30 professions), there is complete autonomy from the other societies, and no cross-interference between societies, under the umbrella.

There were a number of meetings, including one at the Alberta Legislature Building with the MLAs, at which Mr Schultz was the key speaker representing the five societies. The presentation, made to the Honorable Clint Dunford, Minister of Human Resources and his committee (including Ron Hicks, DM, and Dave Wismer, ADM), was favourably received. At this and other meetings, it became very clear that in the near future, all professional societies in Alberta will be formatted as per the Health Professions Act.

Meetings were held that involved the ASPB until late November, at which time the Board decided that the ASPB should pull out from this group. I felt that, even though ASET is willing to finance the costs for bringing the ASPB and the other societies under the proposed umbrella, the best interests of the ASPB were not being served.

I expressed this feeling to the Board on several occasions. Many of the Board felt the same way.

In the meantime, I have been in contact with the registrars and executive directors of the Alberta Institute of Agrologists and the Alberta College of Professional Foresters as of October 2002. These two societies welcomed joint, exploratory meetings with the ASPB. The first meeting with all three societies present occurred in early 2003. I anticipate that discussions with these societies, and the Professional Biologists of British Columbia, will assist in tracking government changes that will affect how the ASPB grows and develops during the next decade.

Clearly we will have to move quickly to accommodate the most likely changes and/or dissolution of the Professional and Occupational Associations Registration Act (POARA).

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Bios Bits

Water for Life: Alberta's strategy for sustainability

All Albertans need to change behaviours and attitudes on how we think about and use water if we are going to protect and preserve our water for future generations.

An emphasis on water conservation is one of the key recommendations in a draft provincial water strategy -- Water for Life: Alberta's Strategy for Sustainability -- released March 27. Other key recommendations include managing water quality and quantity issues regionally - or watershed by watershed -- and ensuring communities and stakeholders are actively involved in local water management decisions.

With the release of the draft strategy Albertans are now being invited to provide comments on the draft recommendations to help shape the final strategy, to be released in Fall 2003.

All Albertans are being invited to provide their feedback by May 31, 2003, on-line at www.waterforlife.gov.ab.ca or by calling 310-4455 for an information package and feedback form.

This draft strategy outlines key directions, strategies and actions to manage Alberta's water resources more effectively. To download a pdf version of the strategy visit www.waterforlife.gov.ab.ca/images/wflreport.pdf

Alberta Grizzly Recovery Team

This big game species is one of our most inspiring wildlife animals. Continued use of sound wildlife management principles is essential for addressing grizzly populations. At the request of the Minister of Sustainable Resource Development, a grizzly bear recovery team has been established to recommend goals, objectives and strategies for a healthy grizzly bear population in Alberta. The multi-stakeholder team includes representation from provincial and federal governments, Alberta conservation groups, the forest, cattle, and oil and gas industries, landowners and academia, which will report back to the Minister.

Many people visit the large tracts of public land where grizzly bears live. This potential for contact may lead to habitat damage, bear-human conflict or bears becoming too familiar with people. This team will look closely at grizzly habitat issues and consider all causes of mortalities among bears, from cubs to adults, in addition to other factors.

"There is no doubt about it - urbanization and the activities that come with it are challenges for managing bears and other wildlife," said Minister Cardinal. "Alberta is doing an excellent job in dealing with population growth and the resulting economic development. But we have to work together on continuing to incorporate good management practices into our planning."

Global Invasive Species Database

The Global Invasive Species Database was developed by the IUCN/SSC Invasive Species Specialist Group (ISSG) as part of the global initiative on invasive species led by the Global Invasive Species Programme (GISP). It provides global information on invasive alien species to agencies, resource managers, decision-makers, and interested individuals.

The database focuses on invasive species that threaten biodiversity and covers all taxonomic groups from micro-organisms to animals and plants. Species information is supplied or reviewed by expert contributors from around the world and includes: biology, ecology, distribution, management information, references, contacts, links and images.

www.issg.org/database/welcome

One Hundred of the World's Worst Invasive Alien Species

Invasive species have been recognised globally as a major threat to biodiversity (the collected wealth of the world's species of plants, animals and other organisms) as well as to agriculture and other human interests.

It is very difficult to choose 100 invasive species, from around the world, that really are "worse" than any others. Species and their interactions with ecosystems are very complex. Some species may have invaded only a restricted region, but have a huge probability of expanding, and causing further great damage Other species may already be globally widespread, and causing cumulative but less visible damage. Many biological families or genera contain large numbers of invasive species, often with similar impacts; in these cases one representative species was chosen. The one hundred species aim to collectively illustrate the range of impacts caused by biological invasion.

Well-known invasive species in Canada include the zebra mussel, the sea lamprey, the European chafer (lawn grubs), and purple loosestrife. Scientists have discovered more than 160 invaders in the Great Lakes alone.

No one knows the exact number of invasive species that are now in Canada or the total cost they impose on the economy. But the list is long and the costs are estimated in the billions.

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Bios Bits

Ten years after the federal commitment to prevent the introduction of invasive species or to control or eradicate them, their presence in Canada continues to grow.

DECISION ON DUNVEGAN HYDRO-ELECTRIC PLANT

The Alberta Energy and Utilities Board (EUB) and the Natural Resources Conservation Board (NRCB) denied an application by Glacier Power Ltd. (Glacier), to construct and operate an 80 megawatt hydro-electric plant on the Peace River upstream of the Dunvegan Bridge.

Glacier Power required approval in accordance with the Natural Resources Conservation Board Act for the construction of a water management project and with the Hydro and Electric Energy Act for construction of a new hydroelectric generating facility. Since both Boards have jurisdiction, a joint review panel was established to assess whether the Dunvegan Project would be in the public interest.

Issues discussed at the hearing 4-day hearing in Fairview, Alberta last October 2002 included the economic benefits to the community and the Province, the potential for increased flooding to the Town of Peace River, the effects of the project on area residents who currently use the Shaftesbury ferry and ice bridge, the impacts to fish populations, and safety issues for boaters and for drivers using the Dunvegan Bridge.

Significant uncertainty remains concerning the potential benefits and costs of the project. In its findings, the Panel noted that while each of the potential negative economic, social and environmental effects of the project, if they were to occur, are substantive on their own, their cumulative effect clearly outweighs the social and economic benefits of the project to the local community, as well as to Albertans in general. The Panel was also not convinced that there were reasonable opportunities to offset or mitigate these potential negative effects.

Panel Findings

Overall, the economic and social benefits of the Project would be positive - 300 man-years of work during construction as well as ongoing employment for three to six people during operations. Other benefits included local purchases of materials, goods and services and municipal, provincial and federal taxes.

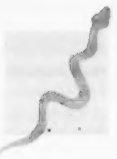
However, there were a number of potential operational constraints that may eventually affect the Project and which could result in the generation of less than the expected revenues, reducing the associated economic benefits. There was little evidence that the Project would have an effect, positive or negative, on the reliability of local electricity supply.

In considering the potential economic and social costs, there was significant uncertainty as to whether the Project increased the risk of flooding in the Town of Peace River. Although Glacier quantified these risks through modeling, considerable judgment was involved in the interpretation of the model results. Other ice experts did not share Glacier's conclusions.

In light of the severe social and economic consequences of past floods, any increase to the risk of flooding at the Town of Peace River would be a very significant negative impact and Glacier's proposed mitigation might not be sufficient to reduce the risks to the town to acceptable levels.

A high probability of impact on the Shaftesbury crossing existed, reducing the use of the ice bridge and possibly the ferry. As a result, local residents who use the crossing would be adversely affected and there were no suggested mitigations.

There was a reasonable chance that there would also be an increase in safety risks, both to boaters on the Peace River, due to the hydraulics of the weir, and to vehicles using the Dunvegan Bridge, due to increased winter fog and ice. Although the increase in the chance of these events happening may be relatively small, the magnitude of these negative impacts, if they do occur, clearly made them significant.



With respect to the impacts of the Project on First Nations, the footprint of the Project would extend approximately from Taylor, B.C. downstream to the vicinity of Sunny Valley, Alberta. Any impacts to communities that did occur would be confined within that footprint and that as a result, there was no real economic or social risk to the residents of the Paddle Prairie Métis Settlement, Ft. Smith or the Peace Athabasca Delta.

Although Glacier modified the project's design in order to reduce impacts to the fish populations of the Peace River to acceptable levels, the uncertainty around the potential effectiveness of these changes remained unacceptably high. Nor was the Panel satisfied that the use of adaptive management techniques post construction would be sufficient to address these concerns.

The full text of the decision is available on the EUB website at www.eub.gov.ab.ca or NRCB website at www.nrcb.gov.ab.ca

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North Slope continued

communities; and increase contacts between North Slope communities and those outside the area.

Damage to Tundra from Off-Road Travel - Surface erosion, water flow and tundra vegetation on the North Slope have been altered by extensive off-road travel. Some damage has persisted for decades. The current 3-dimensional survey method requires a high density of seismic-exploration trails. Networks of these trails now cover extensive areas and are readily visible from the air, degrading visual experiences of the North Slope. Despite technological improvements and increased care taken by operators, the potential for damage to the tundra still exists because of the large number of vehicles and camps used for exploration.

Effects on Animal Populations - Bowhead whales' fall migrations have been displaced by the noise of seismic exploration. Garbage and food provided by people working in oil fields have resulted in higher than normal densities of predators (such as brown bears, arctic foxes, ravens, and glaucous gulls) that prey on the eggs, nestlings, and fledglings of birds. As a result, the reproduction rates of some bird species such as black brant, snow geese, eiders, and probably some shorebirds in industrial areas are, at least in some years, insufficient to balance death rates. These populations may persist in the oil fields only because of immigration of individuals from source areas where birth rates exceed death rates.

The combined effects of industrial activity and infrastructure and the stress imposed by insects in some summers reduced calf production in the Central Arctic caribou herd. Although accumulated effects have not prevented an increase in the overall size of the Central Arctic Herd, the spread of industrial activity into other areas caribou use for calving and insect relief, especially to the east where the coastal plain is narrower, would likely affect reproductive success, unless the degree to which it disturbs caribou can be reduced.

Interactions of Climate Change and Oil Development - Global and regional climates have changed throughout the Earth's history, but climate changes during the past several decades on the North Slope have been unusually rapid. If recent warming trends in climate continue, as many projections indicate, the effects will accumulate over the next century to alter the extent and timing of sea ice, affect the distribution and abundance of marine and terrestrial plants and animals, and affect permafrost as well as the usefulness of current oil-field technologies and how they affect the environment.

Interference with Subsistence Activities - The Inupiat Eskimo people of the North Slope have a centuries-old nutritional and cultural relationship with the bowhead whale. Because noise from exploratory drilling and marine seismic exploration have caused fall migrating bowhead whales to change their movements, subsistence hunters have been forced to travel greater distances to find whales, increasing their risk of exposure to adverse weather and the likelihood that a whale's tissues will have deteriorated before the carcass can be landed.

The Gwich'in Indians of NE Alaska and NW Canada have a centuries-old nutritional and cultural relationship with the Porcupine Caribou Herd. Most Gwich'in oppose any oil development that would threaten the herd, especially on the calving ground, which they consider sacred, and thereby threaten their cultural survival. These threats have accumulated because repeated attempts to develop areas used by the herd have occurred and will probably continue to occur.

Social Changes in North Slope Communities - Most North Slope residents have positive views of many of the economic changes that have resulted from revenue generated by petroleum activities, such as access to better medical care, availability of gas heat for houses, improved plumbing, and higher personal incomes. At the same time, however, balancing the economic benefits of oil activities against the accompanying loss of traditional culture and other societal problems that can occur is often a dilemma for North Slope residents. The discovery of oil and its development on the North Slope has resulted in major, important, and probably irreversible changes to the way of life in communities. These effects accumulate because they arise from several ongoing, interacting causes.

Cumulative Aesthetic, Cultural, and Spiritual Consequences - Many activities associated with oil development have compromised wildland and scenic values over large areas. Some Alaska Natives told the committee that they violate what they call "the spirit of the land," a value central to their relationship with the environment. These consequences have increased in proportion to the area affected by development, and they will persist as long as the landscape remains altered.

Future Accumulation of Effects

The committee assessed possible future accumulation of effects, assuming conditions favorable to continued expansion of oil and gas activities using technology and regulatory oversight at least as good as those currently used.

North Slope Cultures' Response to Declining Revenues - For North Slope residents, the current way of life of North Slope communities made possible by oil and gas activities will be more difficult to maintain when these activities cease as oil is depleted because other sources of funds appear to be modest. Eventual adjustments to reduced financial resources are unavoidable. Their nature and extent will be shaped by adaptations North Slope communities have made to the accumulated effects of the cash economy.

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Willow and Lichen Workshops in Jasper National Park!

Attention botanists and lichen enthusiasts! The Prairie and Northern Plant Diversity Centre is proud to present lichen and willow workshops in the summer of 2003. These rare opportunities to learn identification techniques from internationally recognized experts are open to anyone interested in developing their understanding of and appreciation for these notoriously challenging groups of organisms.

Each workshop will emphasize hands-on laboratory and field instruction based at Jasper National Park's Palisades Centre, and will include visits to diverse field sites within the Park vicinity. All participants will receive written material to support their continuing exploration of willows and lichens.

Accommodation and meals at the Palisades Centre may be arranged at the time of registration on a first-come-first-served basis.

Willows Instructor: Dr. George Argus
Dates: July 15 (Evening) - July 18, 2003
Fee: $225.00
Accom. and Meals: $200.00 (based on double occupancy)

Lichens Instructor: Dr. Irwin Brodo
Dates: July 21 (Evening) - July 25, 2003
Fee: $275.00
Accom. and Meals: $270.00 (based on double occupancy)

Course fees may be reduced depending on outside funding support received by the PNPDC. Single rooms may be arranged for an additional $40 / night.

To register, or to obtain further information, please contact Jennifer Doubt at the Devonian Botanic Garden by telephone (780-987-3054) or by e-mail (jdoubt@ualberta.ca)

Register Now

The World Wolf Congress 2003
Bridging Science and Community

September 25-28, 2003
Banff, Alberta

The Central Rockies Wolf Project is inviting the world community to share scientific and community approaches to wolf management and conservation. This congress will bring together an international delegation of scientists, government agencies, various interest groups, and the general public to discuss wolf ecology and conservation.

North Slope concluded

Legacy of Abandoned Infrastructure and Unrestored Landscapes - The network of roads, pads and pipelines, and infrastructure that support production will likely remain in place for many years to come. The oil industry and regulatory agencies have made dramatic progress in reducing the effects of new gravel fill by reducing the size of the gravel footprint required for many types of facilities and substituting ice for gravel for certain types of roads and pads. However, much less attention has been directed to restoring already disturbed sites. To date, only about 1% of the habitat on the North Slope affected by gravel fill has been rehabilitated.

With the exception of well-plugging and abandonment procedures, state, federal, and local agencies have largely deferred decisions regarding the nature and extent of restoration that will be required. Because natural recovery in the Arctic is slow, the effects caused by abandoned and unrestored infrastructure are likely to persist for centuries and could accumulate further as new structures are added.

Expansion of Activities into New Areas - Oil and gas exploration is spreading into hillier terrain and into coastal plain areas with soils, vegetation and aquatic environments that differ substantially from current areas of activity. To assess effects in these environments, they should be characterized through description of topography, permafrost conditions, sand, gravel, and water availability, hydrological conditions, and a description of the biotic communities present. In addition, future exploratory activity will probably be carried out in a warming climate, with milder winter temperatures and shorter periods of freezing conditions.

Filling Knowledge Gaps - As industrial activities proceed, it is vital to continue collecting and analyzing information on the North Slope's physical, biological, and human environments to help decision makers in developing and implementing effective natural resources management. Advantage should be taken of opportunities to learn from these activities (adaptive management).

Cumulative Environmental Environmental Effects of Oil and Gas on the North Slope is available from the National Academies Press, Fifth Street, NW, Washington, DC 20001; 800-624-6242 or 202-334-3313 (in the Washington area); http://www.nap.edu

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2002 Report of the Commissioner of the Environment and Sustainable Development

Chapter 1 - Toxic Substances Revisited
The production, use, and release of industrial chemicals, pesticides, and their by-products in Canada can pose serious risks to the health of Canadians and to the environment. Some chemicals are associated with health problems such as cancer, decreased fertility, and neurological disorders. The federal government's scientific investigation of existing industrial chemicals and pesticides, and its management of their use were last audited in 1999. This chapter revisits the departments previously audited to assess their progress in implementing the original recommendations.

Chapter 2 - The Legacy of Federal Contaminated Sites
Thousands of contaminated sites exist on federal lands across Canada. These sites can lead to water contamination, take valuable land out of productive use, and threaten human health and the environment. In 1995 and 1996 we audited various aspects of the federal government's management of its contaminated sites. This chapter examines the federal government's progress in the management of these sites since these audits. The audit includes a survey of 15 federal departments and agencies that own or manage contaminated sites as well as a more focussed audit of four key departments: Fisheries and Oceans Canada, Indian and Northern Affairs Canada, National Defence, and Transport Canada.

Chapter 3 - Abandoned Mines in the North
Abandoned mines in northern Canada are complex contaminated sites inherited by the federal government from past private-sector mining operations. These sites pose serious health and environmental threats. This chapter examines the management of northern abandoned mines by Indian and Northern Affairs Canada, as well as the measures it has taken to ensure that mining companies operating in the North pay for the cleanup of environmental problems they create now and in the future.

Chapter 4 - Invasive Species
Canada is assailed by invasive species that pose significant threats to both our ecosystems and our economy. The objective of this audit was to determine whether the federal government has mounted an effective response to the invasive species problem since signing the International Biodiversity Convention in 1992, and particularly since finalizing the Canadian Biodiversity Strategy in 1995. The chapter also presents case examples illustrating the nature and magnitude of the risks that invasive species pose to Canada.

Chapter 5 - Sustainable Development Strategies
The sustainable development strategies adopted by federal departments and agencies are meant to initiate changes in government policies, programs, and activities that will lead to the implementation of sustainable development practices. In this audit, the Commissioner looked at two key departments responsible for natural resources issues, to determine whether the process of creating and implementing sustainable development strategies has changed the way they deliver their mandates. The chapter also contains a consolidated report on their progress and examines whether they are accurately reporting to Parliament on their success in achieving their sustainable development objectives.

Chapter 6 - Exercising Your Right to Know: The Environmental Petitions Process
The environmental petitions process under the Auditor General Act is becoming more widely known and used. The Commissioner of the Environment and Sustainable Development is convinced of the great promise of this process, and reports in this chapter on the petitions received and their responses from government departments. This report also marks the establishment of a comprehensive website that makes available to all Canadians, the text of the petitions received to date, and the departmental responses to them-a commitment made by the Commissioner in her 2001 report.

To download visit www.oag-bvg.gc.ca/domino/oag-bvg.nsf/html/environment.html